

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1-35. (canceled)

36. (new) A process for humidifying an atmosphere in a sterilization chamber to a target relative humidity, the process comprising the steps of

a) providing an amount of water in a water reservoir at a temperature  $T_s$  at or above a temperature of the chamber atmosphere  $T_c$ ;

b) reducing a pressure in the chamber to a value below the boiling point of water at the reservoir temperature  $T_s$ ;

c) bringing the reservoir into fluid communication with the chamber for exposing the water in the reservoir at the temperature to the reduced pressure in the chamber for a preselected exposure time so that water in the reservoir is boiled and to allow resulting water vapour to enter the chamber and disconnecting said fluid communication after said preselected exposure time;

and repeating at least steps b) and c) a plurality of times, wherein at least one of the amount of water and the exposure time are controlled such that the relative humidity in the chamber progressively increases with each repetition until the target humidity is reached.

37. (new) A method according to claim 36, wherein the chamber and the reservoir are in fluid communication by means of a conduit having a valve to open and close the conduit.

38. (new) A method according to claim 37, wherein after each step c) the conduit is closed for a time sufficient to adjust the temperature  $T_s$  or  $T_c$  of the reservoir or chamber so that  $T_s$  is equal to or above the temperature  $T_c$  of the chamber.

39. (new) A method according to claim 36, wherein steps b) and c) are repeated from 5 to 27 times.

40. (new) A method according to claim 36, wherein steps b) and c) are repeated at least 10 times and for each of the last 10 times the water vapour pressure in the chamber is increased by an amount in the range of from 0.01 to 5 Torr.

41. (new) A method according to claim 36, wherein the temperature of the water in the reservoir is maintained from 0 to 3°C above the temperature of the chamber.

42. (new) A method according to claim 36, wherein the first time steps b) and c) are effected, the relative humidity in the chamber is increased to no more than 60% of the target relative humidity.

43. (new) A method according to claim 36, wherein the number of times steps b) and c) are repeated and the increase in the relative humidity in the chamber after each step b) is selected to avoid substantially any condensation in the chamber.

44. (new) A method of humidifying an enclosed space to a target relative humidity, the method comprising a plurality of humidification stages  $S^x \dots S^n$ , wherein  $x$  is an integer from 1 to  $n$  and each  $x$  represents an individual stage, each said stage having a corresponding water vapour pressure  $h_x, \dots, h_n$ , and  $h_n$  representing the water vapour pressure corresponding to the target relative humidity, each said stage  $S_x$  including the steps of a) supplying water vapour from a water vapour source to the enclosed space to increase the water vapour pressure in the space to at least the value  $h_x$  corresponding to said stage  $S_x$ , b) disconnecting the source from the space for a preselected equilibration period, and c) repeating steps a) and b) until said water vapour pressure  $h_n$  is reached in the space.

45. (new) A method according to claim 44, wherein the water vapour source is a water reservoir, the temperature of the water vapour source is  $T_s$ , the temperature of the space is  $T_c$ , for each said stage  $S_x$  there is a corresponding temperature differential value  $\Delta T_x$  which is represented by an equation  $T_s - T_c = \Delta T$  wherein  $T_s$  is the same as, or higher

than,  $T_c$  so that  $\Delta T_x \propto 0$  and step b) comprises disconnecting the source from the space for a time sufficient to adjust  $T_s$  or  $T_c$  to achieve the value for  $\Delta T_x$ .

46. (new) A method according to claim 44, wherein  $n$  is from 5 to 27.

47. (new) A method according to claim 44, wherein  $n$  is greater than 10 and for each stage  $S_x$  of the last 10 stages, from  $n-10$  to  $n$ , each increase in water vapour pressure from the previous stage  $S_{x-1}$  to the stage  $S_x$ , said increase represented by  $h_x - h_{x-1}$ , is in the range of from 0.01 to 5 Torr.

48. (new) A method according to claim 44, wherein the value of  $h_1$  for the first stage represents a relative humidity of no more than 60% of the target value.

49. (new) A method according to claim 44, wherein said space is sterilization chamber for a humidified ozone sterilization process.

50. (new) A method according to claim 44, wherein the number of stages and the corresponding water vapour pressure values are selected to avoid substantially any condensation in said space.

51. (new) An apparatus for sterilization with humidified ozone, the apparatus comprising  
a sterilization chamber,

a reservoir to hold water while in operation, to provide a source of water vapour to humidify the ozone,

a conduit in fluid communication between the reservoir and the sterilization chamber,

a valve in the conduit to open and close the conduit,

a first heating means to control the temperature of the chamber,

a second heating means to control the temperature of the reservoir,

a first temperature sensing means to monitor the temperature of the sterilization chamber,

a second temperature sensing means to monitor the temperature of the reservoir,

a pressure sensing means to monitor the pressure in the chamber,

vacuum means to reduce the pressure in the chamber,

a processor to control the first and second heating means in response to information from the first and second temperature sensing means and the pressure sensing means,

wherein the processor is programmed to effect a humidification of the sterilization chamber in a plurality of stages.

52. (new) An apparatus according to claim 51, wherein said plurality of stages is from 5 to 7.

53. (new) An apparatus according to claim 51, wherein said plurality of stages is greater than 10 and the processor is programmed to effect a water vapour pressure increase in each of the last 10 stages in the range of from 0.01 to 5 Torr.

54. (new) An apparatus according to claim 51, wherein the processor is programmed to maintain the temperature of the reservoir from 0 to 3°C above the temperature of the chamber.